

CLMPTO

October 21, 2004

D.T

1. An apparatus for high energetic ultrasonic tissue treatment in a target area inside a living body from an outside surface or a body cavity of the living body comprising an ultrasound generator (101, 102), a device (21) to be applied against the skin or mucous membrane at the site of treatment, and a transducer (28) connected with the ultrasound generator to emit generated therapeutic ultrasound energy through said device, characterized in that means are provided for cooling a contact surface of said device (21) to be engaged with the skin or mucous membrane and that said device (21) is made as an exchangeable product forming a heat exchange element between the device and the tissue.



2. The apparatus as in claim 1 wherein said device allows adjustment of the relative position of the transducer and said device to define the location of the target area to be treated, and to concentrate the therapeutic ultrasound energy emitted through said device on tissue to be treated medically in the target area.

3. The apparatus as in claim 2 wherein said means for cooling the contact surface comprises means for circulating a fluid.

BEST AVAILABLE COPY

4. The apparatus as in claim 3 further comprising means for controlling the temperature of the circulating fluid.

5. The apparatus as in claim 3 further comprising means for measuring the temperature of said contact surface.

6. The apparatus as in any of claims 1 to 5 wherein the ultrasound generator is designed to generate also diagnostic ultrasound energy to be emitted by the transducer, and further comprising a comparator (107) for comparing echoes of diagnostic ultrasound energy from treated tissue in the target area with backscattered signal of either di-

agnostic or therapeutic ultrasound energy from untreated tissue.

7. The apparatus as in claim 6 wherein the comparator (107) is operatively connected with the transmitter (101, 102) to interrupt the transmission of therapeutic ultrasound energy when the echoes of backscattered signals equal a reference signal from untreated tissue.

8. The apparatus as in claim 6 or 7 further comprising a calculator (106) for calculating the thickness of the tissue between two surfaces (A, B) by means of echoes of diagnostic ultrasound energy received at said surfaces.

9.. A method for non-invasive ultrasonic wave medical treatment of tissue in a target area inside a living body from an outside surface or a body cavity of the living body comprising the steps of emitting diagnostic and therapeutic ultrasound energy, defining the location of the target area by diagnostic ultrasound energy, concentrating therapeutic ultrasound energy on tissue to be treated medically in the target area, and controlling the condition of the tissue in the target area by backscattered ultrasound between therapeutic ultrasound pulses.

Art Unit: 3737

10. The method as in claim 9 wherein the location of the target area is defined by registering echo pulses of diagnostic ultrasound energy emitted against the tissue.

11. The method as in claim 9 or 10 wherein the therapeutic ultrasound energy is focused on the target area.

12. The method as in any of claims 9 to 11 wherein the therapeutic ultrasound energy is pulsed.

13. The method as in any of claims 9 to 12 wherein the therapeutic ultrasound energy is emitted in periods spaced by pauses.

14. The method as in claim 13 wherein the condition of the tissue in the target area is checked by the emission of diagnostic ultrasound energy in said pauses.

15. An apparatus for high energetic ultrasonic tissue treatment in a target area inside a living body from an outside surface or a body cavity of the living body comprising:

an ultrasound generator;

a device to be applied against the skin or mucous membrane at the site of treatment;

a transducer connected with the ultrasound generator to emit generated therapeutic ultrasound energy through said device;

cooling means for cooling a contact surface of said device to be engaged with the skin or mucous membrane, wherein said device is made as an exchangeable product forming a heating exchange element between the device and the tissue.

16. The apparatus according to claim 15, wherein said device allows adjustment of the relative position of the transducer and said device to define the location of the target area to be treated, and to concentrate the therapeutic ultrasound energy emitted through said device on tissue to be treated medically in the target area.

17. The apparatus according to claim 2, wherein said means for cooling the contact surface comprises means for circulating a fluid.

18. The apparatus according to claim 17, further comprising:  
means for controlling temperature of the circulating fluid

19. The apparatus according to claim 17, further comprising:  
means for measuring a temperature of said contact surface.

20. The apparatus according to claim 15, wherein the ultrasound generator is also generates diagnostic ultrasound energy to be emitted by the transducer, and further comprises a comparator for comparing echoes of diagnostic ultrasound energy from treated tissue in the target area with backscattered signal of either diagnostic or therapeutic ultrasound energy from untreated tissue.

21. The apparatus according to claim 20, wherein the comparator is operatively connected with the transmitter to interrupt the transmission of therapeutic ultrasound energy when the echoes of backscattered signals equal a reference signal from untreated tissue.

22. The apparatus according to claim 20, further comprising:  
a calculator for calculating the thickness of the tissue between two surfaces by  
means of echoes of diagnostic ultrasound energy received at said surfaces.
  
23. A method for non-invasive ultrasound wave medical treatment of tissue in  
a target area inside a living body from an outside surface or a body cavity of the living  
body, comprising the steps of:  
emitting diagnostic and therapeutic ultrasound energy;  
defining the location of the target area by diagnostic ultrasound energy;

concentrating therapeutic ultrasound energy on tissue to be treated medically in the target area;  
controlling the condition of the tissue in the target area by backscattered ultrasound between therapeutic ultrasound pulses.

24. The method according to claim 23, wherein the location of the target area is defined by registering echo pulses of diagnostic ultrasound energy emitted against the tissue.

25. The method according to claim 23, wherein the therapeutic ultrasound energy is focused on the target area.

26. The method according to claim 23, wherein the therapeutic ultrasound energy is pulsed.

27. The method according to claim 23, wherein the therapeutic ultrasound energy is emitted in periods spaced by pauses.

28. The energy according to claim 27, wherein the condition of the tissue in the target area is checked by the emission of diagnostic ultrasound energy in said pauses.

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**